

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 30 NOV 2005

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Applicant's or agent's file reference M/45166-PCT	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/EP2004/006791	International filing date (day/month/year) 23.06.2004	Priority date (day/month/year) 24.06.2003
International Patent Classification (IPC) or national classification and IPC C25B11/03, C25B11/02		
Applicant DE NORA ELETTRODI S.P.A.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 25.04.2005	Date of completion of this report 28.11.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Desbois, V  Telephone No. +31 70 340-8952	



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP2004/006791

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

### Description, Pages

1-17 as originally filed

### Claims, Numbers

1-21 as originally filed

### Drawings, Sheets

1/7-7/7 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/006791

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
  - ☒ claims Nos. 21  
because:
    - ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
    - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
    - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
  - ☒ no international search report has been established for the said claims Nos. 21
  - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
    - the written form ☐ has not been furnished
    - ☐ does not comply with the standard
    - the computer readable form ☐ has not been furnished
    - ☐ does not comply with the standard
  - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
  - ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/EP2004/006791

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-20
	No: Claims	
Inventive step (IS)	Yes: Claims	1-20
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/006791

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. The document D1 is regarded as being the closest prior art to the subject-matter of **claim 1**, and shows (the references in parentheses applying to this document):

An electrode structure for an electrolysis cell divided by a separator into an anodic compartment and a cathodic compartment (Fig. 3 ; col. 3, l. 9-18), comprising at least one movable surface suited to be put into contact with a separator (col. 3, l. 12-18) and provided with a thicker component (Fig. 3 : E) and a thinner component overlapped thereto (Fig. 3 : M), the thicker component being generally planar and the thinner component being a thin sheet layer provided with openings or a thin mesh of wires, characterised in that both the thicker and the thinner component are provided with a catalytic coating (Example 3 : col. 7, l. 41-49).

The subject-matter of independent claim 1 differs from the disclosure of D1 in that :

Only the thicker component is provided with a catalytic coating, thus the catalytic coating is provided only at a certain distance from the surface area which is in contact with the cell separator.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

As an effect, the content of oxygen in chlorine is reduced, while the cell voltage is not increased.

The problem to be solved by the present invention may be regarded as increasing the process' efficiency.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Although the prior art suggests that leaving the portion of the electrode which is in contact with the membrane might have several beneficial effects, such as :

- reducing risks of mechanical damage of the membrane (see documents D2 and D3)
- allowing better gas circulation (see document D3)

there is a further improved property, being the decreased oxygen content in chlorine (see description, p. 11, l. 16-p. 12, l. 19), while keeping similar cell voltage values. This seems to be an effect of the specific structure of the electrode structure such as described in claim 1 (superimposed components, in which the thinner component, which is in contact with the membrane, is an uncoated mesh of wires), see description (p. 13, l. 20-29), and excess oxygen production wastes energy while it may cause problems in downstream processing (p. 13, l. 15-19). This effect is not mentioned in the available prior art, nor is obvious for the person skilled in the art. Consequently, the skilled person would have no hint to combine the teaching of D1 with either D2 or D3 to solve the problem posed.

**2. Claims 2-19** is dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**3.** Since claim 19 is new and inventive, **claim 20**, which is a process carried out in the cell of claim 19 is new and inventive, according to article 33(2) and (3) PCT.

#### **Re-Item VIII.**

The application does not meet the requirements of Article 6 PCT, because **claims 20** is not clear.

**1.** In **claim 20**, the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical feature necessary for achieving this result.

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/EP2004/006791

